UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

| 24269 | 7590 | 04/25/2008 |

GUNNISON MCKAY & HODGSON, LLP
1900 GARDEN ROAD
SUITE 220
MONTEREY, CA 93940

EXAMINER
SHAN, APRIL YING

ART UNIT	PAPER NUMBER
2135	

DATE MAILED: 04/25/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,700	09/25/2003	Eduard K. de Jong	SUN040023	9228

TITLE OF INVENTION: PERMUTATION OF OPCODE VALUES FOR APPLICATION PROGRAM OBFUSCATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1440	$300	$0	$1740	07/25/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24209   7590   04/25/2008

GUNNISON MCKAY & HODGSON, LLP
1900 GARDEN ROAD
SUITE 220
MONTEREY, CA 93940

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

_____ (Depositor's name)

_____ (Signature)

_____ (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,700	09/25/2003	Eduard K. de Jong	SUN040023	9228

TITLE OF INVENTION: PERMUTATION OF OPCODE VALUES FOR APPLICATION PROGRAM OBFUSCATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1440	$300	$0	$1740	07/25/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
SHAN, APRIL YING	2135	713-190000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____   Date _____

Typed or printed name _____   Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,700	09/25/2003	Eduard K. de Jong	SUN040023	9228

24209   7590   04/25/2008

GUNNISON MCKAY & HODGSON, LLP
1900 GARDEN ROAD
SUITE 220
MONTEREY, CA 93940

EXAMINER
SHAN, APRIL YING

ART UNIT	PAPER NUMBER
2135	

DATE MAILED: 04/25/2008

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 715 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 715 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

	Application No.	**Applicant(s)**
Notice of Allowability	10/672,700	DE JONG, EDUARD K.
	Examiner	**Art Unit**	
	APRIL Y. SHAN	2135	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *18 December 2007 and 25 February 2008*.

2. ☒ The allowed claim(s) is/are *1-7, 16-22, 31-37 and 46-52*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

      a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

          1. ☐ Certified copies of the priority documents have been received.

          2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

          3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

      * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO/SB/08),
    Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413),
    Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____.

DETAILED ACTION

1.   The Applicant's amendments, filed 18 December, 2007 and 25 February 2008, have been received and entered into the record, and respectfully and carefully considered.

2.   As a result of the amendment, claims 1, 4-5, 16, 19-20, 31, 34-35, 46 and 49-50 have been amended; claims 8-15, 23-30, 38-45 and 53 -63 are withdrawn. Therefore, claims 1 -63 are pending in this application.

Specification

3.   As a result of the amendment to the specification and Applicant's argument is persuasive; therefore, the examiner withdraws the pending objection.

Double Patenting

4.   Applicant's arguments to double patenting rejection are entered and the arguments are persuasive and therefore, the examiner withdraws the double-patenting rejection (Please see also see advisory action issued by the examiner on 22 January 2008, in which the examiner states the double patenting rejection is withdrawn).

EXAMINER'S AMENDMENT

5.   An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee. Authorization for this examiner's amendment was given in a telephone interview with Mr. Forrest Gunnison (Registration No. 32,899) on 8 April 2008. The amendments are to cancel non-elected claims and further clarify the invention.

The application has been amended as follows:

IN THE CLAIMS:

➢ Claims 8-15, 23-30, 38-45 and 53-63 (Cancelled)

➢ Amended claims:

(Claim 1). (Currently Amended) A method for executing an obfuscated application program, the method comprising:

receiving an obfuscated application program, said obfuscated application program comprising at

least one instruction opcode value encoded using one of a plurality of instruction set opcode value

encoding schemes,

wherein each of said instruction set opcode value encoding schemes includes an entry

corresponding to said at least one instruction opcode value,

each of said instruction opcode value encoding schemes is represented in a different

dispatch table in a plurality of dispatch tables;

each dispatch table in said plurality of dispatch tables permutes instruction

implementation methods in a same instruction set; and

each of said instruction opcode value encoding schemes creates a different one-to-

one mapping between a set of numbers and said instruction implementation methods

in said same instruction set; and so that each of said instruction set opcode value

encoding schemes uses a different opcode value encoding for said entry;

determining a dispatch table associated with said application program, said dispatch table

corresponding to said one of a plurality of instruction set opcode value encoding schemes; and

executing said application program using said associated dispatch table.

(Claim 3). (Currently Amended) The method of claim 1 wherein said determining comprises selecting a

dispatch table from a~~said~~ plurality of dispatch tables in response to said receiving, said plurality of dispatch

tables stored in a memory.

(Claim 4). (Currently Amended) A method for executing an obfuscated application program, the method

comprising:

    receiving an obfuscated application program, said obfuscated application program comprising at

    least one instruction opcode value encoded using one of a plurality of non-standard instruction set

    opcode value encoding schemes,

        wherein each of said non-standard instruction set opcode value encoding schemes include

        an entry corresponding to said at least one instruction opcode value<u>,</u>

            <u>each of said non-standard instruction opcode value encoding schemes is represented</u>

            <u>in a different dispatch table in a plurality of dispatch tables;</u>

            <u>each dispatch table in said plurality of dispatch tables permutes instruction</u>

            <u>implementation methods in a same instruction set; and</u>

            <u>each of said instruction opcode value encoding schemes creates a different one-to-</u>

            <u>one mapping between a set of numbers and said instruction implementation methods</u>

            <u>in said same instruction set</u>; ~~and~~ <u>so that </u>each of said non-standard instruction set

            opcode value encoding schemes uses a different opcode value encoding for said

            entry;

determining an instruction set opcode value encoding scheme associated with said obfuscated

application program;

rewriting said application program using a standard opcode value encoding scheme if said received

application program is not encoded using said standard opcode value encoding scheme; and

executing said application program using a dispatch table associated with said standard opcode

value encoding scheme.

(Claim 5). (Currently Amended) A method for application program obfuscation, the method comprising:

reading an application program comprising code;

transforming said application program code into transformed application program code that uses

one of a plurality of opcode value encoding schemes of a dispatch table associated with said

application program,

wherein each of said instruction set opcode value encoding schemes includes an entry

corresponding to at least one instruction opcode value.

each of said instruction opcode value encoding schemes is represented in a different

dispatch table in a plurality of dispatch tables;

each dispatch table in said plurality of dispatch tables permutes instruction

implementation methods in a same instruction set; and

each of said instruction opcode value encoding schemes creates a different one-to-

one mapping between a set of numbers and said instruction implementation methods

in said same instruction set; and so that each of said instruction set opcode value

encoding schemes uses a different opcode value encoding for said entry; and

sending said transformed application program code.

(Claim 16). (Currently Amended) A program storage device readable by a machine, embodying a program of instructions executable by the machine to perform a method for executing an obfuscated application program, the method comprising:

receiving an obfuscated application program, said obfuscated application program comprising at least one instruction opcode value encoded using one of a plurality of instruction set opcode value encoding schemes,

wherein each of said instruction set opcode value encoding schemes includes an entry corresponding to said at least one instruction opcode value,

each of said instruction opcode value encoding schemes is represented in a different dispatch table in a plurality of dispatch tables;

each dispatch table in said plurality of dispatch tables permutes instruction implementation methods in a same instruction set; and

each of said instruction opcode value encoding schemes creates a different one-to-one mapping between a set of numbers and said instruction implementation methods in said same instruction set; and so that each of said instruction set opcode value encoding schemes uses a different opcode value encoding for said entry;

determining a dispatch table associated with said application program, said dispatch table corresponding to said one of a plurality of instruction set opcode value encoding schemes; and

executing said application program using said associated dispatch table.

(Claim 18). (Currently Amended) The program storage device of claim 16 wherein said determining comprises selecting a dispatch table from a~~a~~said plurality of dispatch tables in response to said receiving, said plurality of dispatch tables stored in a memory.

(Claim 19). (Currently Amended) A program storage device readable by a machine, embodying a program of instructions executable by the machine to perform a method for executing an obfuscated application program, the method comprising:

receiving an obfuscated application program, said obfuscated application program comprising at least one instruction opcode value encoded using one of a plurality of non-standard instruction set opcode value encoding schemes,

wherein each of said non-standard instruction set opcode value encoding schemes include an entry corresponding to said at least one instruction opcode value,

each of said non-standard instruction opcode value encoding schemes is represented in a different dispatch table in a plurality of dispatch tables;

each dispatch table in said plurality of dispatch tables permutes instruction implementation methods in a same instruction set; and

each of said instruction opcode value encoding schemes creates a different one-to-one mapping between a set of numbers and said instruction implementation methods in said same instruction set; ~~and so that~~ so that each of said non-standard instruction set opcode value encoding uses a different opcode value encoding for said entry;

determining an instruction set opcode value encoding scheme associated with said obfuscated

application program;

rewriting said application program using a standard opcode value encoding scheme if said received

application program is not encoded using said standard opcode value encoding scheme; and

executing said application program using a dispatch table associated with said standard opcode

value encoding scheme.

(Claim 20). (Currently Amended) A program storage device readable by a machine, embodying a

program of instructions executable by the machine to perform a method for application program

obfuscation, the method comprising:

reading an application program comprising code;

transforming said application program code into transformed application program code that uses

one of a plurality of opcode value encoding schemes of a dispatch table associated with said

application program,

wherein each of said instruction set opcode value encoding schemes includes an entry

corresponding to at least one instruction opcode value,

each of said instruction opcode value encoding schemes is represented in a different

dispatch table in a plurality of dispatch tables;

each dispatch table in said plurality of dispatch tables permutes instruction

implementation methods in a same instruction set; and

each of said instruction opcode value encoding schemes creates a different one-to-

one mapping between a set of numbers and said instruction implementation methods

in said same instruction set; and so that each of said instruction set opcode value

encoding schemes uses a different opcode value encoding for said entry; and

sending said transformed application program code.

(Claim 31). (Currently Amended) An apparatus for executing an obfuscated application program, the

apparatus comprising:

a processor; and

a memory, coupled to said processor, having stored therein computer readable instructions wherein

executing said computer readable instructions on said processor provides:

means for receiving an obfuscated application program, said obfuscated application program

comprising at least one instruction opcode value encoded using one of a plurality of

instruction set opcode value encoding schemes,

wherein each of said instruction set opcode value encoding schemes includes an entry

corresponding to said at least one instruction opcode value,

each of said instruction opcode value encoding schemes is represented in a

different dispatch table in a plurality of dispatch tables;

each dispatch table in said plurality of dispatch tables permutes instruction

implementation methods in a same instruction set; and

each of said instruction opcode value encoding schemes creates a different

one-to-one mapping between a set of numbers and said instruction

implementation methods in said same instruction set; and so that each of said

instruction set opcode value encoding schemes uses a different opcode value

encoding for said entry;

means for determining a dispatch table associated with said application program, said

dispatch table corresponding to said one of a plurality of instruction set opcode value

encoding schemes; and

means for executing said application program using said associated dispatch table.

(Claim 33). (Currently Amended) The apparatus of claim 31 wherein said means for determining

comprises means for selecting a dispatch table from a~~said~~ plurality of dispatch tables in response to said

receiving, said plurality of dispatch tables stored in a memory.

(Claim 34). (Currently Amended) An apparatus for executing an obfuscated application program, the

apparatus comprising:

a processor; and

a memory, coupled to said processor, having stored therein computer readable instructions wherein

executing said computer readable instructions on said processor provides:

means for receiving an obfuscated application program, said obfuscated application program

comprising at least one instruction opcode value encoded using one of a plurality of non-

standard instruction set opcode value encoding schemes,

wherein each of said non-standard instruction set opcode value encoding schemes

include an entry corresponding to said at least one instruction opcode value,

each of said non-standard instruction opcode value encoding schemes is

represented in a different dispatch table in a plurality of dispatch tables;

each dispatch table in said plurality of dispatch tables permutes instruction

implementation methods in a same instruction set; and

each of said instruction opcode value encoding schemes creates a different

one-to-one mapping between a set of numbers and said instruction

implementation methods in said same instruction set; and so that each of said

non-standard instruction set opcode value encoding schemes uses a different

opcode value encoding for said entry;

means for determining an instruction set opcode value encoding scheme associated with said

obfuscated application program;

means for rewriting said application program using a standard opcode value encoding

scheme if said received application program is not encoded using said standard opcode

value encoding scheme; and

means for executing said application program using a dispatch table associated with said

standard opcode value encoding scheme.

(Claim 35). (Currently Amended) An apparatus for application program obfuscation, the apparatus

comprising:

a processor; and

a memory, coupled to said processor, having stored therein computer readable instructions wherein

executing said computer readable instructions on said processor provides:

means for reading an application program comprising code;

means for transforming said application program code into transformed application program

code that uses one of a plurality of opcode value encoding schemes of a dispatch table

associated with said application program,

wherein each of said instruction set opcode value encoding schemes includes an entry

corresponding to at least one instruction opcode value,

<u>each of said instruction opcode value encoding schemes is represented in a different</u>

<u>dispatch table in a plurality of dispatch tables;</u>

<u>each dispatch table in said plurality of dispatch tables permutes instruction</u>

<u>implementation methods in a same instruction set; and</u>

<u>each of said instruction opcode value encoding schemes creates a different one-to-</u>

<u>one mapping between a set of numbers and said instruction implementation methods</u>

<u>in said same instruction set;</u> and <u>so that</u> each of said instruction set opcode value

encoding schemes uses a different opcode value encoding for said entry; and

means for sending said transformed application program code.

(Claim 46). (Currently Amended) An apparatus for executing an obfuscated application program, the

apparatus comprising a user device configured to:

receive an obfuscated application program, said obfuscated application program comprising at least

one instruction opcode value encoded using one of a plurality of instruction set opcode value

encoding schemes,

wherein each of said instruction set opcode value encoding schemes includes an entry

corresponding to said at least one instruction opcode value.

each of said instruction opcode value encoding schemes is represented in a different

dispatch table in a plurality of dispatch tables;

each dispatch table in said plurality of dispatch tables permutes instruction

implementation methods in a same instruction set; and

each of said instruction opcode value encoding schemes creates a different one-to-

one mapping between a set of numbers and said instruction implementation methods

in said same instruction set; and so that each of said instruction set opcode value

encoding schemes uses a different opcode value encoding for said entry;

determine a dispatch table associated with said application program, said dispatch table

corresponding to said one of a plurality of instruction set opcode value encoding schemes; and

execute said application program using said associated dispatch table.

(Claim 49). (Currently Amended) An apparatus for executing an obfuscated application program, the

apparatus comprising a user device configured to:

receive an obfuscated application program, said obfuscated application program comprising at least

one instruction opcode value encoded using one of a plurality of non-standard instruction set

opcode value encoding schemes,

wherein each of said non-standard instruction set opcode value encoding schemes include

an entry corresponding to said at least one instruction opcode value.

<u>each of said non-standard instruction opcode value encoding schemes is represented</u>

<u>in a different dispatch table in a plurality of dispatch tables;</u>

<u>each dispatch table in said plurality of dispatch tables permutes instruction</u>

<u>implementation methods in a same instruction set; and</u>

<u>each of said instruction opcode value encoding schemes creates a different one-to-</u>

<u>one mapping between a set of numbers and said instruction implementation methods</u>

<u>in said same instruction set;</u> ~~and~~ <u>so that</u> each of said non-standard instruction set

opcode value encoding schemes uses a different opcode value encoding for said

entry;

determine an instruction set opcode value encoding scheme associated with said obfuscated

application program;

rewrite said application program using a standard opcode value encoding scheme if said received

application program is not encoded using said standard opcode value encoding scheme; and

execute said application program using a dispatch table associated with said standard opcode value

encoding scheme.

(Claim 50). (Currently Amended) An apparatus for application program obfuscation, the apparatus

comprising an application program provider configured to:

read an application program comprising code;

transform said application program code into transformed application program code that uses one of

a plurality of opcode value encoding schemes of a dispatch table associated with said application

program,

wherein each of said instruction set opcode value encoding schemes includes an entry

corresponding to at least one instruction opcode value,

each of said instruction opcode value encoding schemes is represented in a different

dispatch table in a plurality of dispatch tables;

each dispatch table in said plurality of dispatch tables permutes instruction

implementation methods in a same instruction set; and

each of said instruction opcode value encoding schemes creates a different one-to-

one mapping between a set of numbers and said instruction implementation methods

in said same instruction set; and so that each of said instruction set opcode value

encoding schemes uses a different opcode value encoding for said entry; and

send said transformed application program code.

Reason for Allowance

5.   The following is the Examiner's statement of reasons for allowance: Applicant's

arguments submitted on 25 February 2008 were considered persuasive – the prior art does

not teach the limitations which have been amended onto independent claims. The closest

prior art fails to disclose the features of in an obfuscated application program comprising at

least one instruction opcode value encoded using one of a plurality of instruction set opcode

value encoding schemes, wherein each of said instruction set opcode value encoding

schemes includes an entry corresponding to said at least one instruction opcode value, each

of said instruction opcode value encoding schemes is represented in a different dispatch

table in a plurality of dispatch tables; each dispatch table in said plurality of dispatch tables

permutes instruction implementation methods in a same instruction set; and each of said

instruction opcode value encoding schemes creates a different one-to-one mapping between

a set of numbers and said instruction implementation methods in said same instruction set;

so that each of said instruction set opcode value encoding schemes uses a different opcode

value encoding for said entry in combination with the other limitations recited in independent

claims 1, 4-5, 16, 19-20, 31, 34-35, 46, 49-50

Allowable Subject Matter

6.   Claims 1-7, 16-22, 31-37 and 46-52 are allowed.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be

directed to April Y. Shan whose telephone number is (571) 270-1014. The examiner can normally be

reached on Monday - Friday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Y.

Vu can be reached on (571) 272-3859. The fax phone number for the organization where this application

or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be obtained from

either Private PAIR or Public PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC)

at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative

or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-

1000.

/April Y Shan/

Examiner, Art Unit 2135

/KIMYEN VU/

Supervisory Patent Examiner, Art Unit 2135